

AMENDMENTS TO THE CLAIMS

1. (Currently amended) Apparatus including

a first device having a plurality of network input interfaces and a plurality of network output interfaces, said first device including a packet information extractor coupled to at least one of said network input interface, said first device comprising logic for extracting packet information without performing packet forwarding decisions;

a second device coupled to said packet information extractor, said second device capable of generating packet forwarding information and output port information responsive to an output of said packet information extractor, wherein said second device performs generating packet forwarding information substantially for first packets substantially in parallel with said first device performing extracting packet information for other packets, wherein the second device accesses a forwarding memory to record one or more forwarding information rules as the forwarding information rules become available to the second device in response to changes in any one of network topology, access control, and administrative and managerial rules;

an information link, coupled to said first device and said second device;

a network flow routing engine coupled to said second device, wherein the network flow routing engine determines network flow packet forwarding information in response to receiving network flow information associated with said output of said packet information extractor and provides said network flow packet forwarding information to said second device, wherein said second device uses said network flow packet forwarding information in generating said packet forwarding information.

2. (Original) Apparatus as in claim 1, wherein said first device includes a packet rewriter coupled to at least one said net-work output interface; and

said second device includes a packet rewrite generator coupled to said first device, said packet rewrite generator disposed for generating said packet forwarding information and output port information;

wherein said packet rewrite element is responsive to said packet rewrite generator.

3. (Original) Apparatus as in claim 1, including a packet buffer memory coupled to said first device.
4. (Previously Presented) Apparatus as in claim 1, wherein said first device comprises a single monolithic semiconductor circuit.
5. (Previously Presented) Apparatus as in claim 1, wherein said second device comprises a single monolithic semiconductor circuit.
6. (Previously Presented) Apparatus as in claim 1, wherein a single monolithic semiconductor circuit comprises said first device and said second device.
7. (Original) Apparatus as in claim 1, including a rewrite table including said re-write information.
8. (Original) Apparatus as in claim 7, wherein said first device includes said re-write table.
9. (Original) Apparatus as in claim 7, wherein said second device includes an address pointing into said rewrite table, wherein said address can be forwarded to said first device.
10. (Currently amended) Apparatus including
a first device having at least one input interface and at least one output interface, said first device including an information extractor having an input coupled to a packet received from said input interface and having an output coupled to a first memory, said first device comprising logic for extracting packet information without performing packet forwarding decisions; and
a second device including a decision generator having an input coupled to said first device, and having an output coupled to said first device, wherein said second device performs generating packet forwarding information substantially for first packets substantially in parallel with said first device performing extracting packet information for other packets, wherein the second device accesses a forwarding memory to record one or more forwarding information rules

as the forwarding information rules become available to the second device in response to changes in any one of network topology, access control, and administrative and managerial rules;

wherein said first device is responsive to a forwarding treatment from said second device to determine a set of said output interfaces on which to couple said packet;

a network flow routing engine coupled to said second device, wherein the network flow routing engine determines network flow packet forwarding information in response to receiving network flow information associated with said packet information extracted by said information extractor and provides said network flow packet forwarding information to said second device, wherein said second device uses said network flow packet forwarding information in generating said packet forwarding information.

11. (Original) Apparatus as in claim 10, wherein said forwarding treatment includes packet rewrite information; and

said first device is responsive to said packet rewrite information to rewrite said packet before coupling said packet to said set of output interfaces.

12. (Original) Apparatus as in claim 10, wherein said forwarding treatment includes at least one action relating to accounting.

13. (Original) Apparatus as in claim 10, wherein said forwarding treatment is responsive to information regarding access control.

14. (Original) Apparatus as in claim 10, wherein said forwarding treatment is responsive to information regarding class of service or quality of service.

15. (Original) Apparatus as in claim 10, wherein said forwarding treatment is responsive to information regarding parsing, extracting and encoding the packet information passed from said first device to said second device so as to minimize the amount of said information forwarded between said first device and said second device.

16. (Original) Apparatus as in claim 10, wherein said forwarding treatment is responsive to said packet information memory.

17. (Previously Presented) Apparatus as in claim 10, wherein said first device comprises a single monolithic semiconductor circuit.

18. (Previously Presented) Apparatus as in claim 10, wherein said second device comprises a single monolithic semiconductor circuit.

19.-22. (Cancelled)

23. (Currently amended) A method for packet processing comprising the computer-implemented steps of:

at a Packet Processing Engine, receiving a plurality of input packets at one or more input interfaces, distinguishing first packet header information from a first input packet, and forwarding said first packet header information to a Fast Forwarding Engine;

at the Fast Forwarding Engine, determining packet forwarding information, and sending said packet forwarding information to the Packet Processing Engine;

a network flow routing engine coupled to said Fast Forwarding Engine, wherein the network flow routing engine determines network flow packet forwarding information in response to receiving network flow information associated with said first packet header information and provides said network flow packet forwarding information to said Fast Forwarding Engine, wherein said Fast Forwarding Engine uses said network flow packet forwarding information in generating said packet forwarding information;

generating, at said Packet Processing Engine, an output packet based on said packet forwarding information and said first packet; and

sending said output packet from a first output interface among one or more output interfaces of the Packet Processing Engine,

wherein the Fast Forwarding Engine is coupled to and accesses a forwarding memory to record one or more forwarding information rules as the forwarding information rules become

available to the Fast Forwarding Engine in response to changes in any one of network topology, access control, and administrative and managerial rules.

24. (Previously Presented) A method as recited in Claim 23, wherein the steps performed by the Packet Processing Engine and the steps performed by the Fast Forwarding Engine are performed in parallel.
25. (Previously Presented) A method as recited in Claim 23, wherein said one or more input interfaces are coupled to at least one communication network.
26. (Previously Presented) A method as recited in Claim 23, wherein the step of distinguishing first packet header information from a first input packet is performed by parsing said first packet.
27. (Previously Presented) A method as recited in Claim 23, wherein the packets are stored and accessed by a packet index.
28. (Previously Presented) A method as recited in Claim 23, wherein the first packet header includes an IP source address, IP source port, IP destination address, IP destination port, protocol type, and information indicating whether the packet is unicast or multicast.
29. (Previously Presented) A method as recited in Claim 23, wherein the step of generating an output packet based on said packet forwarding information includes a rewrite operation.
30. (Previously Presented) A method as recited in Claim 29, wherein the rewrite operation includes adjusting hop count for the packet, determining a new CRC and performing packet reformatting operations.
31. (Previously Presented) A method as recited in Claim 23, wherein said Fast Forwarding Engine is coupled to assistance devices for assisting in making packet forwarding decisions.

32. (Previously Presented) A method as recited in Claim 23 wherein said Fast Forwarding Engine is coupled to a set of routing information memories.
33. (Previously Presented) A method as recited in Claim 23, wherein said Fast Forwarding Engine is coupled to a forwarding content addressable memory.
34. (Canceled).
35. (Previously Presented) A method as recited in Claim 23, wherein said Fast Forwarding Engine is coupled to an input access Content Addressable Memory and an output access Content Addressable Memory.
36. (Canceled).
37. (Previously presented) A method as recited in Claim 33, wherein the Fast Forwarding Engine sends the packet header information to the forwarding content addressable memory.
38. (Previously Presented) A method as recited in Claim 36 wherein the Content Addressable Memory determines packet forwarding information based on the packet header information.
39. (Canceled)
40. (Previously Presented) A method as recited in Claim 23, wherein the Fast Forwarding Engine accesses the forwarding Content Addressable Memory to retrieve the packet forwarding information.
41. (Previously Presented) A method as recited in Claim 23, wherein the Fast Forwarding Engine forwards an identifier to said first input interface to determine if access is permitted for said first packet.

42. (Previously Presented) A method as recited in Claim 23, wherein the Fast Forwarding Engine forwards an identifier to said first output interface to determine if access is permitted for said first packet.

43. (Previously Presented) A method as recited in Claim 23, further comprising the step of storing said first packet in said Packet Processing Engine.